

Edição especial - Sociedade e ambiente no Semiárido: controvérsias e abordagens
Vol. 55, p. 470-493, dez. 2020. DOI: 10.5380/dma.v55i0.73174. e-ISSN 2176-9109



SISTEMA
ELETRÔNICO
DE REVISTAS
SER | UFPR

www.ser.ufpr.br

Challenges to balance food demand and supply: analysis of PNAE execution in one semiarid region of Brazil

Desafios para equilibrar demanda e oferta de alimentos: análise da execução do PNAE em uma região semiárida do Brasil

Viviany Moura CHAVES¹, Liana Galvão Bacurau PINHEIRO¹, Renata Alexandra Moreira das NEVES¹, Maria Arlete Duarte de ARAÚJO¹, Joana Barbosa da SILVA¹, Paulo Eneas Rolim BEZERRA¹, Michelle Cristine Medeiros JACOB¹

¹ Universidade Federal do Rio Grande do Norte, Natal, RN, Brasil.

* E-mail para contato: vivianychaves@ufrn.edu.br

Artigo recebido em 26 de abril de 2020, versão final aceita em 27 de agosto de 2020, publicado em 18 de dezembro de 2020.

ABSTRACT: This study intended to address the challenges faced by the National School Feeding Program (PNAE) to implement public purchases from family farming, as they understand their role in the transformation of local food systems. For this, we developed a qualitative, exploratory, and descriptive study, in the state of Rio Grande do Norte, located in the northeastern semiarid region, during the regional assessments done by the Collaborating Center for the School Feeding Program in 2018 and 2019. We analyzed the policy from the perspective of the social actors inserted at the ends of the supply and demand chain through the application of questionnaires and focus groups. There were 188 social actors from 45 municipalities taking part in our data gathering. We examined the meeting of supply and demand based on the performance of the policy in the state, and identified that: i) the percentage of purchases between 2011 and 2017 was, on average, 19.1%, demonstrating that, despite not meeting the recommended rate, the state has progressed its investments in this segment; ii) some limitations characterized the limited effectiveness of public purchases of family farming for schools: lack of federal actions to enhance the value of family farming, unfavorable conditions for local agricultural production, low performance of technical rural assistance, menus do not reflect the offer of family farming, difficulties in preparing and executing the public call and insufficient communication between social actors; iii) Action and decision-making, through *street-level bureaucracy*, depends on the discretion of the social actors. We believe that this study can collaborate in the understanding of structural problems that affect

the implementation of the program and assist in the search for alternatives that are consistent with the current needs, aiming at the construction of sustainable food systems.

Keywords: school feeding; family farming; public purchase; sustainable food systems; semiarid.

RESUMO:

Este estudo pretendeu abordar os desafios no Programa Nacional de Alimentação Escolar (PNAE) para efetivação das compras públicas oriundas da agricultura familiar, por entender seu papel frente à transformação dos sistemas alimentares locais. Para isso, desenvolvemos um estudo qualitativo, exploratório e descritivo, no Estado do Rio Grande do Norte, situado no semiárido nordestino, durante as assessorias regionalizadas realizadas pelo Centro Colaborador de Alimentação e Nutrição Escolar em 2018 e 2019. Analisamos a política pela perspectiva dos atores sociais inseridos nas pontas da cadeia de oferta e demanda, por meio da aplicação de questionários e grupo focal. Participaram da nossa avaliação 188 atores sociais de 45 municípios. Analisamos o encontro da oferta e demanda a partir do desempenho da política no estado e identificamos que: i) o percentual de compra entre 2011 e 2017 foi, em média, de 19,1%, demonstrando que, apesar de não atender ao percentual recomendado, o estado tem progredido neste segmento; ii) a pouca efetividade das compras públicas da agricultura familiar para as escolas foi caracterizada por algumas limitações: carência de ações públicas para valorização da agricultura familiar, condições desfavoráveis para produção agrícola local, baixa atuação da assistência técnica rural, baixa adequação dos cardápios à oferta da agricultura familiar, dificuldades na elaboração e execução da chamada pública e comunicação insuficiente entre atores sociais; iii) a ação e tomada de decisão, mediante a *burocracia do nível de rua*, depende da discricionariedade dos atores sociais. Acreditamos que este estudo possa colaborar na compreensão de problemas estruturais que afetam a implementação do programa e auxiliar na busca por alternativas que sejam coerentes com as necessidades vigentes, visando à construção de sistemas alimentares sustentáveis.

Palavras-chave: alimentação escolar; agricultura familiar; compras públicas; sistemas alimentares sustentáveis; semiárido.

1. Introduction

The emphasis on formulating policies and programs that contribute to the reconnection of the food chain - strengthening the relationship between the farmland and the city - has been essential to enhancing Food and Nutrition Security (SAN) and for the construction of models more sustainable food for all (Soares *et al.*, 2015). In this perspective, public policies such as the National School Feeding Program (PNAE, in Portuguese), appear as a potential tool to reintegration supply and demand (Triches & Schneider, 2010). The program finds adherence to at least three objectives of the 17 Sustainable Development Goals (SDGs) presented in the United

Nations Agenda 2030, which are: the eradication of poverty and zero hunger, health and well-being, and quality education (UN, 2017).

Based on the new guidelines established by Law nº 11947 (2009), PNAE has become a relevant institutional segment for the acquisition of foodstuffs from family farming. The norm requires that at least 30% of PNAE food products should be bought with family farmers. With this improvement, the program leverages the food system by reducing food insecurity in the countryside, encouraging the organization of farming families, strengthening the social tissue by boosting the local economy, and expanding the supply of quality food (Brasil, 2017a). However, some municipalities remain

without compliance with this requirement. Some of them have 0% of family farming purchases, even after eleven years after the publication of the law.

According to data from the National Education Development Fund (FNDE, in Portuguese), in 2015, the average percentage of purchases from family farming was 20% in the Northeast, one of the worst performances in the country. Concerning the province of Rio Grande do Norte (RN), in 2017, just 19.6% of its municipalities managed to reach the minimum percentage required by law (Brasil, 2017b).

Some studies indicate that the reasons that hinder the implementation of PNAE are multicausal nature, the difficulties being singular according to the different Brazilian realities (Saraiva *et al.*, 2013; Soares *et al.*, 2015; Machado *et al.*, 2018; Triches *et al.*, 2018). Also, the mismatch between the supply of food from family farming and school demand, makes most of the municipalities decide not to buy these foods or buy from other suppliers, even from suppliers of different provinces (Nunes *et al.*, 2018). Included in this scenario is the work that is performed by the interactions between social actors on the frontline of politics, recognized as street-level bureaucrats, who live in situations marked by risks and tensions (limited resources, double demands, working conditions), in which they can hardly be reduced to formal protocols and prescriptions (Cavalcanti *et al.*, 2018). Such actors located within the scope of the PNAE, live with the excess of regulations that are often contradictory and difficult to comply.

Considering that most municipalities in RN province are unable to comply with the program's legislation, the present study sought to reflect on two main questions: What are the problems that

limit the match between supply and demand? Why do social actors in the municipalities find it difficult to overcome such challenges? The answers to these questions made it possible to analyze the policy from the perspective of social actors inserted at both ends of the supply and demand chain of the school feeding program in the years 2018 and 2019.

Based on these considerations, the present study addressed the challenges faced by the social actors of the PNAE to carry out public procurement from family farming in municipalities in the state of Rio Grande do Norte, seeking to understand their role in the transformation of local food systems.

We begin this article with the *PNAE strengths family farming* section, where we describe the history, regulations, and advances in school feeding policy in Brazil. Then, in *Methods*, we present the outline and analytical plan of this study. In *Results and discussion*, we describe the panorama of the balance of food supply and demand in the school food policy in the Rio Grande do Norte; we highlight some problems that challenge the program's effectiveness; finally, we argue that street-level bureaucracies conditions the decision-making of the implementing agents.

2. PNAE strengths family farming: history, normative, and advances

PNAE's first milestone occurred in 1955, when Decree nº 37106 was signed, instituting the National School Lunch Campaign, under the Ministry of Education (MEC), which had the support of international food donations (Brasil, 1955). The totality of foodstuff distributed to Brazilian schoolchildren came through aids from international institutions

such as the United States Agency for International Development (USAID) and the World Food Program (WFP) of the United Nations Food and Agriculture Organization (FAO) (Brasil, 2017a). After several name changes, institutional ties, and strategies, the PNAE had undergone significant transformations since its creation. Especially between 2003 and 2010, its technical and operational advances gained more visibility (Pedraza *et al.*, 2018).

The current school feeding model in Brazil is considered worldwide as a reference to social programs. Since then, its successful trajectory in the significant reduction of hunger has generated numerous international cooperation initiatives (FAO, 2012; 2015). In these programs, Brazil shares its experience and supports other school feeding programs in developing countries of Africa, Latin America, and the Caribbean. With more than 60 years of existence, the historical evolution in the management of school meals was decisive for the strengthening of the program, mainly in the topics of planning and acquisition of food (Saraiva *et al.*, 2013).

The PNAE migrated from a centralized model at the federal level to a municipal model with the transfer of financial resources to the Executing Entities (EEx), represented by the state departments of education, city halls and federal schools (OPAS - Organization Pan-American of Health, 2017). Due to its municipalization, the program has become the constitutional responsibility of all federated entities, involving many social actors, such as managers, teachers, nutritionists, civil society, family farmers and school cooks (Brasil, 2016).

The publication of the Federal Law no. 11947 (2009) and the FNDE resolution no. 38 (2009)

represented a significant milestone for the FNS agenda in Brazil. The Law, in its art. 14, established the obligation to the EEx to apply at least 30% of the resources transferred by FNDE in purchases from family farming, giving priority to local family farmers in agrarian reform settlements, *quilombola* (groups reminiscent from slaves in Brazil), indigenous communities, and other traditional groups and communities (Brasil, 2009).

This intersection represents a remarkable achievement in terms of sustainable public acquisition initiatives. This innovation in PNAE regulation has the potential to strengthen family farming, by creating management mechanisms for the direct purchase of registered family farmers, to democratize and decentralize public investments, creating a market for small producers, that boost local economy (Brasil, 2016). This Law opened a historical precedent concerning institutional purchases, allowing the public manager to dispense with the bidding process, using another bureaucratic instrument, the Public Call (Peixinho, 2013).

This strategy is based on the relevance of the productive segment within the broad scope of FNS. It promotes, for example, production practices considered less harmful to the environment and to workers (Soares *et al.*, 2015). In this way, the connection between family farmers and consumers promote integration based on principles of sustainability, with implications to the environment, to the economy and to social issues, such as poverty reduction (Saraiva *et al.*, 2013).

According to the National Council for Food and Nutritional Security (CONSEA, in Portuguese), the need to support this productive model is highlighted, through agrarian and agricultural policies, as well as valuing the production of these farmers

(CONSEA, 2010). The contribution that this segment represents in the production of food for the domestic market is relevant for the increase of civil actions of SAN and local development, which aim to promote the right to adequate food (RAF) (Saraiva *et al.*, 2013).

The participation of family farming in institutional purchases within the scope of the PNAE promoted the opening of yet another space for the production and commercialization of these foods, benefiting the municipality, family farmers and students from the public-school system. First, for the municipality, it means the generation of jobs and income, strengthening and diversifying the local economy, and valuing local specificities and eating habits. Second, for the family farmer, it represents a crucial channel for marketing and generating income regularly, offering productive inclusion, creation of jobs in rural areas, and the encouragement of cooperatives and associations. And, third, for students, it guarantees regular and permanent access to better food products in schools, taking a step further towards warranting healthy food according to regional culture and eating practices (Brasil, 2016; 2017).

However, despite the benefits identified, the articulation between PNAE and family farming still occupies a fragile terrain concerning the implementation of the policy in different realities in the country, especially in the Northeastern semiarid region. There are several obstacles and difficulties faced by social actors to achieve the objectives of the program. Seeking to support social actors in the program's execution, FNDE assumed an inductive role by organizing a network of Collaborating Centers for School Food and Nutrition (CECANE, in Portuguese) with federal universities from all over Brazil. The CECANE's purpose is to assist the EEx

in the tasks of monitoring the implementation of PNAE, to offer capacity-building opportunities to professionals that manage the program, to support the School Meals Councils (CAE, in Portuguese), and to develop technical analysis and research on PNAE execution.

3. Methods

This is a qualitative, explanatory, and descriptive study. According to Gil (2008), this approach aims to identify factors that determine or contribute to the occurrence of phenomena. The research was developed in the years 2018 and 2019 by the CECANE team of the Federal University of Rio Grande do Norte (UFRN), being divided into two phases: exploration and synthesis.

The first phase consisted of mapping the municipalities in the state of Rio Grande do Norte that did not reach the mandatory minimum percentage of 30% of the acquisition of foodstuffs from family farming. For the selection of municipalities, we used data from the purchase of family farming for school meals available for public consultation on the FNDE website. These data correspond to the records extracted from the Account Management System (SigPC, in Portuguese), in operation between the years 2011 to 2017. The municipal and state public managers responsible for the local execution of the PNAE produce the SigPC records for the purpose of accountability.

We established the following selection criteria for the municipalities: EEx that reached an average below 20%, during the years 2011 to 2017, of the minimum percentage required for the acquisition of foodstuffs from family farming; EEx closer to the

training pole municipality, that is, cities strategically selected by its central location for the holding of the regional workshops in the synthesis phase. Based on this, we have listed 45 municipalities in a situation of alert regarding non-compliance with the Federal Law.

Subsequently, we gathered data for a diagnosis of the situation of demand for school meals and local agricultural production in the selected municipalities. The data collection process happened in four stages. First, we did a survey of contacts (e.g., telephone and e-mail address) of education and agriculture secretaries, nutritionists, and technicians from the local agricultural technical assistance. Second, we build a data collection instrument containing questions about the current situation of school meals

and agricultural production in the municipalities. Third, we sent the questionnaires by e-mail to local managers. Fourth, via telephone contact, we made the confirmation of receipt of questionnaires. Finally, with the return of the information requested from the managers, we analyzed the data to the initial identification of the supply and demand patterns in these municipalities.

In the second phase, we held six regional workshops in loco. We did four in 2018, in the RN municipalities of Lajes, Umarizal, Cruzeta, and Goianinha. And, the other two, we developed in 2019, in Serrinha dos Pintos and Currais Novos, thus covering all the province’s mesoregions (Figure 1). The proximity and accessibility to the municipalities invited to participate in regionalized



FIGURE 1 – Map of the pole municipalities distributed in the mesoregions of the state of Rio Grande do Norte/Brazil.
SOURCE: Adapted from Google Images.

advisory services were the main criteria for choosing training centers. The contact process with the selected municipalities took place via e-mail and telephone, followed by an official letter from the General Coordination of PNAE and FNDE, addressed to the managers.

We developed regional workshops to complement the initial diagnosis, as well as to promote a dialogue between the relevant actors at both ends of the school supply and demand chain. The methodology used was based on the focus group method, a social research technique that, according to Bauer and Gaskell (2002), consists of analyzing a given object from elements provided by participants in the same group. People reunited, stimulated by the researcher, jointly debate their impressions about a proposed theme.

The maximum number of municipalities invited to each workshop was 10 so that all guests could actively participate. The participation of social actors, who represented their municipalities, occurred voluntarily, and anonymity was guaranteed to the participants (Table 1). In the end, about 188 social actors from 45 municipalities in the state participated in the study.

We performed the analysis of qualitative data by thematic categorization, using the content analysis by Bardin (1977). This methodology consists of three stages: pre-analysis, exploration of the material, and treatment of the data, inferences, and interpretations. The analysis allowed the identification of the most relevant patterns and arguments that replied to our research questions.

This study complied with the provisions of Resolution 466/2012, of the National Health Council, concerning research with human beings and has the approval of the Ethics and Research Committee of the Federal University of Rio Grande do Norte, under the protocol nº 3.640.100.

4. Results and discussion

4.1. Overview of supply and demand between family farming products and school meals

Based on data related to the accountability of municipalities in the state of RN, we analyzed the percentage of acquisition of family farming for PNAE in the period from 2011 to 2017. The rate

TABLE 1 – Regional workshop participants according to their categories.

Categories	Participants	N
Education department managers and staff	Nutritionists (Technical Manager)	38
	Executing Entity Representatives*	42
	Education Professionals**	3
Representatives of the farmers' organization	Family farmers and representatives of associations and cooperatives	33
Other social actors	Representatives of the Agriculture Secretariat, including rural technical assistance	72
	School cooks	
	Agriculture technicians Students	
Total social actors		188

SOURCE: research data.

* Managers, education secretaries, counselors, and school feeding coordinators. ** Directors, teachers, pedagogical coordinators.

of purchase in that period was 19,1%, on average, with the lowest percentage in 2012 (12.1%) and the highest, two years later, in 2014 (26.7%). The most recent data, from 2016 and 2017, show a minimum increase of approximately 1% between the years, going from 18.7% to 19.6%. Although the purchase of these foods has remained constant over the past three years, the situation of municipalities to purchase from family farms for schools has not met the minimum percentage recommended by Law.

By comparing the acquisition percentages between the state of RN and the Northeast region, in the period from 2011 to 2015, we observed that purchases from family farming in the province have been higher than the region's average (Figure 2). The data inference shows that, despite not meeting the recommended percentage, both the state and

the region have progressed, albeit slowly, in their purchases in this segment.

By analyzing the municipalities percentage of acquisition, we found that, on average, 36.5% of them are in the range between 0% and 10%, while the others (63.5%) were unable to exceed 30%. A significant part of these municipalities remains without any purchase of this nature since the implementation of the Law, being stagnant and having difficulties in transposing necessary strategies to the local reality.

In Brazil, during 2010, 47.4% of the municipalities purchased food from family farming via PNAE. The rate of purchases in these municipalities was, on average, 22.7%. The South region of the country had the highest percentage of cities that bought food from family farming (71.3%), and the

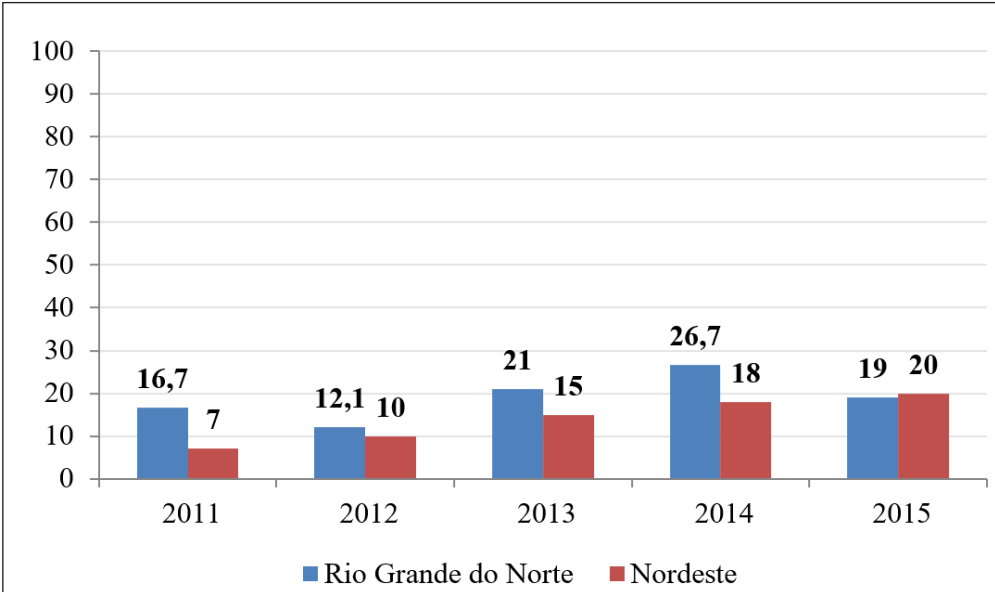


FIGURE 2 – Percentage of purchase from family farming in the period 2011 and 2015 in the state of Rio Grande do Norte and the Northeast region.
SOURCE: Adapted from FNDE (2017) and Nunes *et al.* (2018).

Midwest had the lowest (35.3%) (Saraiva *et al.*, 2013). Nunes *et al.* (2018) verified an evolution in the percentage of acquisition of products from family farming in the Northeast region, migrating from 7% in 2011 to 20% in 2015. Although the region is not reaching the required minimum, being the second with a lower percentage of acquisition between the years mentioned, it was observed that the number of municipalities doubled concerning 2011. The number went from 252 to 592 cities, between 2011 and 2015, which represented 33% of the municipalities in the region.

In a study on the purchase of food from family farming by the PNAE in Brazilian municipalities, Machado *et al.* (2018) indicate that RN is one of the states with the lowest frequencies of cities in compliance with the Law. In the province, only 25.3 % of them managed to spend at least 30% of its resources to purchase food in this segment for schools. Additionally, they observed that the Northeast and South regions hold 50% and 19% of the proportion of family farming establishments in the country, respectively. However, the total food production values in the South are much higher when compared with the Northeast (Machado *et al.*, 2018).

We infer by the results of RN that, since the implementation of the legislation, the province has not managed to exceed the minimum percentage required. The low attendance to acquisitions can be justified by the difficulties faced at the ends of the supply and demand chain of family farming for school meals, which include problems of a political, institutional, operational, and communicational nature. Part of these problems demonstrates that the policy's success depends not only on the performance of the agents involved (social actors) but on

the context in which they are. The diversity of implementation contexts can produce different results from the same public policy, due to the interaction between the policy and the local reality. Besides, resources and the target audience also make up the context to be taken into account for implementation analyzes linked to leading bureaucrats (Fernandez & Guimarães, 2020).

Even so, it is emphasized that the PNAE has conquered a critical role to guarantee the flow of production, enabling a significant opening of the vision of family farmers to a market niche whose dimension was previously unknown (Nunes *et al.*, 2018). However, despite advances in recent years, gaps still exist that limit the effectiveness of the program, which comprise the intended impacts and the real impacts generated by the implementation of the policy.

4.2. Challenges that limit the meeting of supply and demand

The acquisition of public purchases from family farming for school meals requires the articulation between those who buy and those who sell. When the two ends of the chain are disjointed, there are several instabilities generated during the program's implementation process. Part of the obstacles found is due to the daily attitudes of the implementing agents in the interpretation and application of the rules (Pires, 2017). These agents are professionals responsible for executing the policy, making allocative decisions that impact the population's well-being. Thus, the particularities of each sector and social actor involved, directly influence the functioning of the policy, which may cause its success or failure.

TABLE 2 – Summary of problems that challenge supply and demand confluence within PNAE scope, Rio Grande do Norte, 2018-2019.

Problem categories	Specific difficulties
Supply	Lack of public actions to enhance family farming
	Low demand from schools
	Bureaucratic public call process
	Low formal education of producers
Supply	Unfavorable socioenvironmental conditions for the development of local agriculture
	Trend of rural youth migration
	Shortage of rain
	Lack of drought-fighting policies
Supply	Low performance of rural technical assistance
	Reduction of productive capacity
	Access to land
	Inadequate work infrastructure
Demand	School menus do not reflect the biocultural reality and the offer of family farming
	Low coverage of rural extension workers
	Service deficiency
	Little offer of training and education
Demand	Difficulties in navigating bureaucracy by preparing and executing the Public Call
	Nutritionist are unaware of local production
	Menus do not suit seasonality
	Monotonous school menus
Demand	Insufficient communication between social actors
	Lack of mapping local production
	Lack of qualification and training of professionals
	Little public call disclosure
Demand	Weak intersectoral work
	Products without health authorization
	Absence of sales project
	Low performance of rural workers' unions and cooperatives
Demand	Inadequate local infrastructure, especially in small municipalities

SOURCE: research data.

Table 2 presents the main problems that interfere with the articulation between supply and demand within the scope of the PNAE, which has prevented successful policy management in the municipalities.

We analyzed the difficulties reported by the social actors in the investigated municipalities according to the major problems identified in the regional workshops. We divided these categories of problems into two axes, supply and demand, which will be discussed below.

4.2.1. Difficulties with the supply

Lack of public actions to enhance family farming

One of the significant problems in purchasing agricultural products begins with the lack of incentives for farmers. The devaluation of local products and the difficulties imposed during the bureaucratic process of supplying these products (e.g., sales project), were problems pointed out by social actors, mainly among farmers. The EEEx includes few family farming products in their purchases because they are unaware of local pro-

duction, prioritizing products that do not suit the reality of the municipality and that diverge from the production chains established in that territory. This practice weakens sustainable development by not prioritizing the purchase of diversified products, organic or agroecological, which are produced by local rural organizations.

If you think about valuing the culture and habits of local knowledge, you really must see the need for what we have in our municipality. Look at the importance that he [the student] gives to the farmer when he knows that the food he is eating at school came from the hands of his father, his colleague, people who live in the region. (School feeding representative).

According to the above report, the valorization of local products in schools is the key to enhance the social ties established between the school community and farmers. By providing or eating local products, subjects feel their work and culture represented in the public policy arena. The consequence of this lack of appreciation of family farming has been one of the imperatives that undermine the performance of public purchases for the PNAE, limiting the variety of foods that make up the school menus.

Soares *et al.* (2015) argue that the valorization of the local food culture allows the safe commercialization of food at fairer prices, aiming to establish relationships of trust with the agents involved in the acquisition process. By encouraging local food purchases for schools, PNAE has represented a significant advance in strengthening family farming and, therefore, FNS and food sovereignty (Soares *et al.*, 2015).

A second point to be commented on is that a large part of the municipalities claimed to have the

potential for local agricultural production, having a variety of products and productive profiles in the different mesoregions of the state (Agreste, Central, Leste and Oeste Potiguar). The farming area of the state of RN is formed mainly by small family farmers who depend, above all, on the subsistence of crops of corn, beans, cassava, rice and small livestock (goat, sheep, pig, and chicken) (SEPLAN, 2013). There is also the cultivation of temporary crops such as pineapple, onions, beans, watermelon, and tomatoes. Only the municipality of Baraúna, for example, contributes about 30% and 99% of tomato and onion production across the state, respectively. The sweet potato crops are spread in the territories of Agreste Litoral Sul, Seridó and Mato Grande, especially in the municipalities of Nova Cruz, Currais Novos, Touros and São José de Mipibú, which together represent 38% of the total province production. The cultivation of melon corresponds to 12.50% of the weight in the Gross Domestic Product (GDP) Agricultural of RN, being the third-largest in the state, behind only the production of milk (17.35%) and sugar cane (16 %) (SEPLAN, 2013).

Although the state has a variety of products in the agricultural sector, according to the release of data from the 2017 Census of Agriculture by the Brazilian Institute of Geography and Statistics (IBGE), a trend of progressive shrinkage in the agriculture of Rio Grande do Sul is confirmed in recent years. Between 1975 and 2017, about 20 thousand rural establishments lost their productive function, and almost 500 thousand hectares were no longer used. This panorama is the result of the loss of the productive capacity of rural properties in the Northeast and more pronouncedly in RN, especially the tiny properties. The low profitability of the agricultural activity reduces the economic

viability to continue producing. The generation of income, in most cases, is not enough to cover the expenses of family production (FAERN, 2019). Moreover, small agricultural businesses are vulnerable to problems such as low rainfall, low soil fertility and predominance of the arid and semiarid climate, factors that hinder the development of the activity in certain territories (SEPLAN, 2013; Aquino & Lacerda, 2014).

Another relevant aspect is education and professional training in rural areas. The low level of education is still a recurring reality in rural areas of Brazil. About 15.5% of Brazilian producers have never attended school, 79.1% have not completed elementary school, and the average study in rural areas is only 4.9 years (IBGE, 2014; 2017). Young people in the countryside still face difficulties in accessing professional training courses at any level, be it primary, technical, or higher. Consequently, the trend of migration from rural youth to urban areas has increased more and more, which decreases the replacement of the agricultural work to the next generation. For Andrade *et al.* (2013), the low level of education limits the ability of farmers to seek new alternatives and restricts access to knowledge, which in turn reduces their resilience. Therefore, farmers have tried to depend less on agricultural production and more on sources of external income, and young people seek alternatives outside the rural environment (Andrade *et al.*, 2013).

Therefore, it is necessary to guarantee the allocation of financial resources for basic education projects in the rural area that promote the overcoming of inequalities between urban and rural, imbalances of educational opportunities, and illiteracy among Brazilian regions (FAERN, 2019).

Unfavorable socioenvironmental conditions for the development of local agriculture

From the farmer's experience point of view, the scarcity of rain in the last six years has hampered food production in some mesoregions of the province, mainly in Seridó, Alto, and Midwest of Rio Grande do Norte. On the other hand, in some municipalities on the coast, located in the eastern region of Rio Grande do Norte, the excess of water during the rainy season causes flooding in the production, harming the farmers' crops.

Besides, we observed that municipalities in the same region have specific characteristics regarding the availability of environmental and economic resources, including different ways of coping with drought. For example, the city of Pau dos Ferros, located in Alto Oeste Potiguar, desalinates water to guarantee access to a better-quality resource for production and consumption. Other surrounding cities have considered drilling wells to supply output. However, water quality is often unsuitable for agriculture. Not all these municipalities can provide financial resources to improve their ability to guarantee access to quality water. Therefore, the scarcity of this resource is a problem that directly affects the ability to offer food for school meals. On the one hand, some municipalities manage to create drought coping mechanisms and, consequently, guarantee their local production. Other stagnant cities, however, need more resources to enable minimum production conditions.

Climatic variation is also imperative to be considered to family farming, especially in the semiarid region. In this Brazilian area, agriculture is a naturally risky activity. Family farmers are vulnerable,

because, in addition to being dependent on climate, there is little investment of financial and social capital that enables the development of local productive arrangements (Baiardi & Mendes, 2006; Andrade *et al.*, 2013). In RN, the low levels of rainfall in the Central, Seridó, and parts of the West, associated with practices that promote environmental degradation and desertification, reduce the productive capacity of these regions, affecting all activity, including traditional crop production (FAERN, 2019). The result is a situation of vulnerability that weakens the resource base and, consequently, the sustainability of the system (Wehbe *et al.*, 2005).

In this regard, public policies to cope with drought and coexistence with the semiarid (e.g., Um Milhão de Cisternas Rurais, Programa Sertão Cidadão, and Programa Conviver) has not been enough to solve these problems. Unfortunately, part of governmental actions feeds the drought industry, through the construction of waterworks that favors contractors and large rural properties (Nascimento & Santos, 2019).

The emergency, fragmented, and discontinuous nature of Brazilian public policies to combat drought does not consider that living with the semiarid consists of supporting people in adapting to their climate system. The solution to the problem must start from undertaking permanent and appropriate public policies, based on sustainability, that break with structures of concentration historically present in the semiarid - of land, water, power and access to essential social services (Ab'sáber, 2003; Nascimento & Santos, 2019).

The consolidation of these policies, if planned from the perspective of sustainable development, may ensure the system's resilience. This characteristic increases the capacity of socioecological

systems to cope and adapt to social, political, and environmental stresses to reduce their situation of vulnerability (Cinner & Fuentes, 2009; Andrade *et al.*, 2013).

Some measures aimed at ensuring the sustainability of productive chains permanently can be encouraged by governmental actions, such as: the adoption of production and cultivation systems that minimize losses and waste, ensuring the economy of the production chain and the quality of the product; that ensure income generation for rural workers and that they have decent working conditions with compatible remuneration; that make possible an effective agricultural integration with the rural space, through the multifunctionality of these spaces; and that ensure the use of technologies to increase production and productivity so that they do not degrade the environment (Assad & Almeida, 2004).

Another feature that limits the offer of family farmers' products is access to land. Land should not be seen merely as a factor of production, but also as a place of life and housing, a space for the appropriation and reterritorialization of families (Maia *et al.*, 2018). In 11 years, between 2006 and 2017, the number of rural family farming establishments fell by 9.5%, and the total number of people employed in this segment decreased by 17.6% (IBGE, 2017). The concentration of land properties generates imbalances of income and power by large landowners. One consequence is the increase of conflicts, characterized by rural workers struggling to access land and by indigenous claims aiming the acknowledgment of their traditional territories (Pacheco & Pacheco, 2010). Historically, production is concentrated in the hands of a few, reinforcing social and political inequalities that characterize Brazilian society.

The proposition of food policies, such as PNAE, comes as a tool for a change, through the inclusion of sustainable public purchase. When establishing sustainability as a fundamental aspect of the guarantee of sovereignty and FNS, it is necessary to create strategies for the consolidation of permanent institutional spaces. These strategies involve legal arrangements that formalize the obligations of the State and the responsibilities of the government institutions.

Low performance of rural technical assistance

Rural Technical Assistance Entities (EMATER, in Portuguese) are great partners for family farmers and also for municipalities, providing technical and operational support through the provision of public rural extension services. Regarding their performance in the state, the representatives consider it essential to support institutional purchases within the scope of the PNAE, but recognize that this task has not been successful, due to the difficulties encountered during the process, as we can see in the commentary below:

If we do not have continuous technical assistance and support for work, things are not going forward. In Upanema, we do not have professional assistance, even though we have a magnificent production, the city that wants to have this assistance work, but this is the competence of EMATER. The role of the city is to encourage this work, but EMATER must be active, not just in specific tasks. (Rural technical assistant).

The overload of municipalities, the discontinuity of rural extension technicians and the lack

of dialogue between EMATER and EEx, were the most reported problems by our participants. In some cases, only one technician works in up to three municipalities, as well as in several social programs, which often do not have a partnership with other government agencies.

Besides, the low coverage of rural assistance is one of the main factors in the low dissemination of technical knowledge in rural areas, offering little support to rural men and women. According to the 2017 Agricultural Census, this coverage in RN is quite restricted, approximately 16%. The low attendance of rural assistance, in recent years, has increased together with the drought in the semiarid region. Such limitations occurred as a result of the decrease in resources invested, causing the scrapping of this sector, mainly in small municipalities.

Governmental initiatives, such as the Dom Helder Câmara Project, which make up the rural development plan initiated by the Federal Government in 2002, have been presented as an effective alternative to strengthen and optimize the activities of specialized agricultural technical assistance in the semiarid (Moraes & Callou, 2017). The state's rural support has already occupied a prominent place on the national scene, being considered for its ability to attract projects and resources and for its loom action in promoting rural development (FAERN, 2019). However, the current situation of low coverage, poor service, and reduced work structure indicates the urgent need for actions to change the scenario and assist rural producers in permanent access to knowledge and new technologies.

4.2.2 Difficulties with the demand

School menus do not reflect the biocultural reality and the offer of family farming

About the organization of demand, an important aspect that makes it difficult to purchase food from family farming begins with the elaboration of menus. Farmers reported that nutritionists plan their menus without considering the local products available. For them, these professionals do not understand the dynamics of family markets are different from large supply centers, which provide various products in large quantities, standardized and during all year.

The Law orders but does not oblige the manager to buy in family farming. There is no punishment for those who do not buy. The farmer has excessive productivity (February, March, April). Even so, the menu is not produced thinking about gherkin, watermelon, melon, green beans, corn, pumpkins. It is made with bananas, but bananas in Lajes in RN? There is a gap between thought and reality (Farmer).

I think that when the municipalities are going to make the menus, they should bring together the actors of the city, the associations, EMATER and farmers, to know what is produced and make the menu based on production (Rural technical assistant).

Likewise, nutritionists stressed that it is challenging to map local producers to adapt their menus accordingly to the reality of the municipality and the region. Triches *et al.* (2018), indicate that this is a difficulty also faced in cities in the Southeast and South of the country, reinforcing that the ways of overcoming to meet the demands in schools must start from the dialogue between the two ends of the

supply chain, thus allowing both to understand the functioning and dynamics of the policy.

Moreover, some nutritionists indicate the perception that when local products are included in the school menu, there is little acceptance of food and meals by students. In the opinion of these professionals, the absence of healthy eating habits within the family, coupled with the lack of nutritional food education strategies, contribute to the low acceptance of these foodstuffs. Therefore, the low demand discourages farmers from supplying their products to the PNAE. The nutritionist has a fundamental role in planning a nutritious menu, with quality products for school meals, including regional foods, safeguarding nutritional references and local eating habits, and according to seasonality in the region (Brasil, 2016). The development of food and nutrition education actions, with all scholar communities, is also the responsibility of this professional.

The planning of school menus should be based on the different food production cycles, in which some are more sensitive to seasonality than others. On the other hand, farmers need to manage food production according to school demand to reduce fluctuations and ensure a stable supply of these products (Saraiva *et al.*, 2013).

In this sense, it is understood that the recognition of the agricultural vocation associated with the potential of local production for the food supply of family farming, is fundamental for the construction of a workable school menu. Therefore, knowing what is practiced by family farmers in the region, considering the frequency and seasonality of the products offered, is the fundamental starting point for determining what measures are necessary for family farmers' products to arrive at schools.

Several complaints, regarding the stages of the public call, are unanimously among the municipalities. Usually, the problems are administrative and bureaucratic, which include planning and drafting the Public Call and sales projects. Most of these municipalities find it difficult to understand the PNAE legislation and, therefore, the drafting of the Public call is not always adequate, generating frustration throughout the process.

Some nutritionists pointed out that they do not participate in the mapping of local production, do not have access to this information, and do not participate in the research of food prices that make up the school meal menu. At the other supply chain end, farmers emphasize that despite the interest in selling to schools, the preparation of the sales project requires support from rural technicians. On the other hand, all farmers who are organized in formal family farming groups reported that they did not experience any difficulty in preparing their sales projects. In this sense, the role of associations and cooperatives has been paramount in supporting farmers in participating in the public call, since most of the operational and bureaucratic procedures are facilitated in these formal spaces.

For Triches *et al.* (2018), all these issues cause many family farmers to lose interest in this market since the organization of their supply comes up against the bureaucratic and rigid demand organization. Similarly, the study by Cunha *et al.* (2014), based on reports by nutritionists and program managers in RN, indicates other factors that hamper family farmers' policy access. They are as follows:

bureaucratic difficulties to farmers get the declaration of aptitude so they can figure as beneficiaries of family farmers policy (DAP, in Portuguese), the lack of products without health authorities' authorization, and the absence of registered slaughterhouses. The little experience of family farmers in public procurement processes and the dialogue with other local actors and institutions, to Cunha *et al.*, make these challenges even bigger.

The lack of the Municipal Inspection Service (SIM, in Portuguese) was also an issue mentioned in all regional workshops. According to the reports, the expansion of the offer of family farming to the PNAE would be more significant if the municipalities had SIM. The SIM legalization process in the cities, especially for small ones, is hampered by the following factors: financial difficulty, lack of implementation of an integrated sanitary inspection system, lack of information and guidance on the topic, lack of resources authorities, and disinterest of municipal managers (Prezotto & Nascimento, 2013).

It should also be noted that such problems do not end within the scope of legal provisions or in the articulation of social actors since the dispute for the supply of products is also influenced by the current model that favors large production complexes. In this way, despite the difficulties for its execution, the institutional purchasing process must consider every factor that stands between production and consumption, being guided by the sovereignty and SAN perspective. This mechanism, instrumentalized by the Public Call, allows the use of public resources to meet the food demands of the poorest and offer fragile farmers an access door for the flow of their production.

Insufficient communication between social actors

The lack of articulation between the social actors was one of the most raised questions among the participants. There is a need for spaces for agreement, discussion and governance with the participation of different sectors of civil society. Supporting the articulation between all those involved is fundamental for the proper program execution, as commented by this participant:

There is a need for greater articulation between all actors. When the segment is organized and strengthened, it can enforce the law. The law is necessary and exciting, and there are mechanisms to comply with it. But to make it happen, you need to be articulate. The family farming segment, the government's willingness, the councils, the secretariats focused on rural issues, the municipal administration, the agriculture secretariat. They need to be open and articulated because they are the bridges of this channel (Representative of the CAE).

The feasibility of regular and constant supply requires coordination between those who buy and those who sell. The public purchase initiative is an important policy mechanism aimed at supporting family farmers, ensuring their integration into formal markets. Such actions, in most cases, include standardized rules and practices that do not match the characteristics and capabilities of small producers, which can represent a severe obstacle for family farmers to enter public markets and, therefore, an impediment to the implementation of food purchasing initiatives (Swensson, 2018).

Despite the need for organization between managers and farmers to implement this regulation, it is necessary to recognize that there are limitations

to the implementation of legislation, considering the different contexts of the country. The application of preferential purchasing schemes requires the management of counterparts and the establishment of conditions and guarantees to achieve an appropriate balance, therefore, the elaboration of a regulatory project (Swensson, 2018).

4.3. Frontline actors: between policy executives and policymakers

Another relevant aspect of the analysis comes from the understanding of the roles played by political actors. The action and decision-making in PNAE depend on these social actors.

In the last decades, policy implementation studies have been dedicated to understanding the multiple interactions that directly interfere in the daily lives of the actors who are on the frontline of politics (Sandim & Assis, 2019). The process of implementing public policy is considered a crucial step for its proper performance or failure, as it is at this moment when the formulated objectives are put into practice.

The top-down approach is based on the idea that institutions shape the behavior of the actors, generating results according to incentives, restrictions, objectives or goals described by the standard (Oliveira, 2012; Spinola & Ollaik, 2019). Through this approach, policymakers who work at the base must fulfill the decision-making processes that leave the center. However, for Sandim and Assis (2019), this approach proved insufficient to explain the living dynamics of implementation. One must consider the interactions that transcend the normative framework, constituting a continuous process

of influences and negotiations between different actors, in constant adaptation of the content of the policies of a specific “negotiated order.”

More recently, with advances in public policy studies, it has been possible to understand the multiple perspectives of the bureaucracy’s performance in the policy’s implementation process. In addition to being analyzed from the Weberian perspective of bureaucracy, with its structures and rules, we need to study policies from the perspective of street-level bureaucrats’ performance and their interactions with the other actors involved (Bonelli *et al.*, 2019). As Pires (2009) pointed out, there are controversies about the role of bureaucrats implementing public policies: discretion, on the one hand, and control, in a Weberian view of the State, on the other hand.

For example, if we look at bureaucracy from a structural perspective, following the Weberian view (Weber, 1980), which refers to the agents’ obedience to formal rules, to the position occupied in the bureaucratic hierarchy and the fulfillment of obligations associated with the position assumed in the organization, we observed that the influence of these factors on the performance of the implementers is minimal (Lotta *et al.*, 2014). For Ferreira and Medeiros (2016), there is a vast distance between the policy’s comprehension from actors who occupy the hierarchically superior levels, planning and making decisions; and from the executors’ plan, who is performing policies’ actions daily. The ideal Weberian type deviates considerably from street-level bureaucracies because its operators enjoy broad autonomy in decision-making; that is, they not only execute public policies but also do politics (Oliveira, 2012). Therefore, studying bureaucrats’ importance lies in the fact that the neutrality in the implementation

of public policies, raised a priori by Weber, is not confirmed in practice.

In the process of implementing public policies, Michael Lipsky (1980) uses the term *street-level bureaucracy* to explain that the actors’ decision-making, their action routines, and their strategies for dealing with the uncertain and conflicting work environment make public policies concrete. As Oliveira (2012, p. 1553) describes:

The action of frontline bureaucrats is yet another variable in the policy application equation because they are the ones who actually translate programs into concrete goods and services, that is, citizens are benefited or punished by public authorities through employees who work behind the desks; in doctor’s offices; in classrooms; in prison yards; on street corners. However, the grassroots agent must go beyond the execution of the programs, because often their formulators do not know what they want to achieve with them or do not know how to achieve their goals.

In other words, as Bonelli *et al.* (2019) argue, the decisions of these bureaucrats, who are often part of the social context in which they operate, may oscillate within a wide margin of discretion, depending on their degree of autonomy and the existence of rules clear and complete rules that limit behavior and decision making. These challenges become higher when public policy has a decentralized implementation, as is the case of PNAE. The program - which had its regulations updated according to the new arrangements that outline the general logic of decision and the actors’ performance - insofar as it creates incentives, it also creates constraints regarding its execution. Rules that coordinate and guide the implementation of the policy depend on the discretion of the actors working on it. That is,

this understanding starts from the subjectivity of each subject, seeking to translate the objectives that, many times, are not precise and well defined.

In the case of PNAE, we realized that the lack of coordination between social actors is a bottleneck present in all the municipalities analyzed. Pressured by services externalities and by bureaucracy characteristics, these agents are immersed in work demands and, often, do not know their role in the execution of the program. It is necessary to recognize that these actors lack the time, information and other resources needed for appropriate decision-making. There are several contexts in which these actors find themselves to perform their functions concerning politics, considering unforeseen situations, marked by uncertainties, under immediate pressure from managers, and drawn in the heat of the moment. Therefore, actors in these circumstances need to promptly decide what to do by themselves. Currently serving to around 42 million students from the public school system, spread in a country with a tremendous diversity of nature and cultures, PNAE's policymakers need to enable strategies for its operationalization and its executors' training.

Another point that deserves to be highlighted is the multiplicity of actors that participate in this arrangement, which include: nutritionists, farmers, secretaries, lunch coordinators, school feeding counsellors, school cooks, school directors, teachers, students, members of unions, associations, cooperatives, and so on. The more actors involved; the more bureaucracy is conferred on political norms. Therefore, its executives manage the policy program according to their discretion, that is, acting freely and guaranteeing the authority of the individual over public assignments. But delegating tasks to someone is always risky because agents can dismiss

the program guidelines. They may deviate from the norms and formal procedures in everyday life (Oliveira, 2012). Besides, implementing bureaucrats, faced with the accumulation of a large volume of demands, insufficient resources, and oppressed by the bureaucratic system's gears, can deliberately seek shortcuts, creating practices that allow users to meet a minimum acceptable quality standard (Lipsky, 1980). The actors' autonomy tells us a lot about how public policy will be operationalized. Taking as an example for PNAE in RN, we observed that the bureaucratic processes bring difficulties both for the demand and for the offer of products of family agriculture. The inexistence of SIM, the lack of producer's documentation, the obstacles in price research, and the Public Call bureaucracies, provide clear examples of situations that require technical knowledge and proper articulation of social actors. Besides, elements of functional structure such as access to computers and lack of internet connection in rural establishments are still a weakness experienced both at the state level and by the actors involved.

Considering this, we realize that significant decisions must be made by those on the front lines of politics. The conflict of interest is very present and recurrent in this environment. In this way, the executing agents may resist or deviate from the formal norms brought in, and at the same time, we have agents within the same policy that generate their own efforts and create mechanisms to meet the agreed goals.

That a successful public policy depends on the joint action of the formulator and the executor. Thus, in fact, it only becomes active with a clear understanding of the roles of these two agents. The way of organizing the street-level bureaucracy is

fundamental for the proper performance of politics. Additionally, how social actors operate the standard according to their classifications and judgments created in the program's local logic can increase the risks of reproducing inequalities among those who should be benefited. It is necessary to reflect, to experiment, and to evaluate how this autonomy can be a source of social gains and not the contrary, especially in scenarios with large historic corruption, like developing countries.

5. Final considerations

Analyzing the implementation of a universal coverage policy requires a complex framework of analysis containing the interactions that are established between the norms, the instruments, and actors that constitute their actions. In the PNAE case, this framework is even more challenging because it needs to consider its decentralized execution and all activities, actors, and regulations in the food system.

In this study, we identified that the challenges that stand between the supply and demand of food from family farming for schools derive from a set of problems of a political, institutional, operational and communicational nature, which reflect on the difficulty of transposing necessary strategies for the transformation of the local reality. The multi-causality of these problems portrays the limited effectiveness of public purchases for school meals in the state of RN, which characterized a percentage of entirely below of Law requirements. In the non-conformity analysis is crucial to consider the social and political problems that are in the background of the policy. Among them, we think that the land access is the one that, one time being corrected, has the potential to

boost the food system transformation towards FNS. The land tenure brings with it more opportunities for education, income generation, and social resilience.

Moreover, the lack of communication is one significant issue that we found to match Law compliance, and that should be addressed immediately. Thinking of effective communication strategies should consider the use of Informational and Communication Technologies and the enhancement of social participation. The task of building healthier food systems requires common and integrated ways of managing governance.

It is worth noting that the present study had some limitations. The self-completion forms sent for municipalities partially met the expectations of the survey. Thus, to minimize these problems and complement the required data, the diagnosis was consolidated by conducting regional workshops.

Then, the importance of building integrated public policies is indisputable to overcome traditional biases in sectoral policies. Policymakers, large and small businesses in the private sector, health care providers, environmental groups, consumer and health advocates, farmers, agri-food workers, and citizens must collaborate and take shared ownership in this policy. The reintegration of channels of social participation is vital to connect ideas, considering a broad social and cultural background, and built solutions integrated with people's needs.

Acknowledgements

We thank the team of the Centro Colaborador em Alimentação e Nutrição Escolar of the Universidade Federal do Rio Grande do Norte for the

idealization and realization of this work. We are especially grateful to the municipalities that participated in the study and, above all, to the family farmers and nutritionists who make PNAE happen. We also thank the Fundo Nacional de Desenvolvi-

mento da Educação for financing this product. The funder had no role in the study design, data collection and analysis, decision to publish or prepare the manuscript.

References

- Ab'sáber, A. *Os domínios de natureza no Brasil: potencialidades paisagísticas*. São Paulo: Ateliê Editorial, 2003.
- Andrade, A. J. de; Souza, C. R. de; Silva, N. M. da. A vulnerabilidade e a resiliência da agricultura familiar em regiões semiáridas: o caso do Seridó Potiguar. *Campo-Território: Revista de Geografia Agrária*, 8(15), 2013. Available on: <<http://www.seer.ufu.br/index.php/campoterritorio/article/view/19590>>.
- Aquino, J. R.; Lacerda, M. A. D. Magnitude e condições de reprodução econômica dos agricultores familiares pobres no semiárido brasileiro: evidências a partir do Rio Grande do Norte. *Revista de Economia e Sociologia Rural*, 52, 167-188, 2014. doi: 10.1590/S0103-20032014000600009
- Assad, M. L.; Almeida, J. Agricultura e sustentabilidade: contextos, desafios e cenários. *Ciência & Ambiente*, Santa Maria, 29, 21-22, 2004.
- Baiardi, A.; Mendes, J. Agricultura familiar no semiárido: fatalidade de exclusão ou recurso para o desenvolvimento sustentável. In: *anais do XLIV congresso da SOBER*. Fortaleza, 1-21, 2006. Available on: <<http://www.seagri.ba.gov.br/content/agricultura-familiar-no-semi-%C3%A1rido-fatalidade-de-exclus%C3%A3o-ou-recurso-para-o-desenvolvimento>>.
- Bauer, M. W.; Gaskell, G. *Pesquisa qualitativa com texto, imagem e som*. 2. ed. Rio de Janeiro: Vozes, 2002.
- Bardin, L. *Análise de conteúdo*. Lisboa: Edições 70, 1977.
- Bonelli, F.; Fernandes, A.; Coêlho, D.; Palmeira, J. A atuação dos burocratas de nível de rua na implementação de políticas públicas no Brasil: uma proposta de análise expandida. *Cadernos EBAPE.BR*, 17, 800-816, 2019. doi: 10.1590/1679-395177561
- Brasil. *Decreto- Lei nº 37.106*, de 31 de março de 1955. Institui a Campanha de Merenda Escolar (CME) subordinada ao Ministério da Educação. Brasília: DOU, 2 abr. 1955.
- Brasil. *Decreto-Lei nº 11.947, de 16 de junho de 2009*. Dispõe sobre o atendimento da alimentação escolar e do Programa Dinheiro Direto na Escola aos alunos da educação básica. Brasília: DOU, 2009.
- Brasil. Fundo Nacional de Desenvolvimento da Educação. *Aquisição de produtos da agricultura familiar para a alimentação escolar*. Brasília: FNDE, 2016. Available on: <<https://www.fnde.gov.br/index.php/centrais-de-conteudos/publicacoes/category/116-alimentacao-escolar?download=9870:pnae-informe-2016-03-manual-pnae-2-edicao>>. Acesso em: dez. 2019.
- Brasil. Fundo Nacional de Desenvolvimento da Educação. *Boas práticas de agricultura familiar para a alimentação escolar*. Brasília: FNDE, 2017a. Available on: <<https://www.fnde.gov.br/index.php/centrais-de-conteudos/publicacoes/category/116-alimentacao-escolar?download=11204:boas-pr%C3%A1ticas-de-agricultura-familiar-para-a-alimenta%C3%A7%C3%A3o-escolar>>. Acesso em: dez. 2019.
- Brasil. Fundo Nacional de Desenvolvimento da Educação. *Dados da agricultura familiar*. Brasília: FNDE, 2017b. Available on: <<http://www.fnde.gov.br/programas/alimentacao-escolar>>. Acesso em: 13 abr. 2020.
- Cavalcanti, S.; Lotta, G. S.; Pires, R. R. C. Contribuições dos estudos sobre burocracia de nível de rua. In: Pires, R. R. C.; Lotta, G. S.; Oliveira, V. E. (Orgs.). *Burocracia e políticas públicas no Brasil: interseções analíticas*. Brasília: IPEA; ENAP, 2018. p. 227-246.

- Cinner, J.; Fuentes, M. M. P. B.; Randriamahazo, H. Exploring Social Resilience in Madagascar's Marine Protected Areas. *Ecology And Society*, 14(1), 1-20, 2009. Available on: <<http://www.ecologyandsociety.org/vol14/iss1/art41/>>.
- CONSEA - Conselho Nacional de Segurança Alimentar e Nutricional. *A segurança alimentar e nutricional e o direito humano à alimentação adequada no Brasil: indicadores e monitoramento da Constituição de 1988 aos dias atuais*. Brasília: CONSEA, 2010.
- Cunha, A.; Assis Júnior, I.; Dias, T. F. Promoção do desenvolvimento rural via políticas públicas: o caso da inserção da agricultura familiar no Programa de Alimentação Escolar no Rio Grande do Norte de 2011 – 2012. *Revista Tekhne e Logos*, Botucatu, 5(2), 2014.
- FAERN - Federação da Agricultura, Pecuária e Pesca do Rio Grande do Norte. *Documento de Propostas para a Agropecuária Potiguar 2019-2022*. Natal: FAERN, 2019. Available on: <http://www.senarrn.com.br/wp-content/uploads/2018/09/Propostas_Candidatos_2019-2022.pdf>.
- FAO - Food and Agriculture Organization of the United Nations. *Sustainable Diets and Biodiversity: Directions and Solutions for Policy, Research and Action*. Biodiversity and sustainable diets united against hunger. Rome: FAO, 2012. Available on: <<http://www.fao.org/3/i3004e/i3004e00.htm>>.
- FAO - Food and Agriculture Organization of the United Nations. *School feeding and possibilities for direct purchase from family farming*. Santiago: FAO, 2015. Available on: <<http://www.fao.org/3/a-i3413e.pdf>>.
- Fernandez, M.; Guimarães, N. Abordagens teóricas e metodológicas para analisar a burocracia de rua. *Rev. Bras. Ciênc. Polít. [conectados]*, 32, 283-322, 2020. doi: 10.1590/0103-335220203208
- Ferreira, V.; Medeiros, J. Fatores que moldam o comportamento dos burocratas de nível de rua no processo de implementação de políticas públicas. *Cadernos EBAPE.BR*, Rio de Janeiro, 14(3), 776-793, 2016. doi: 10.1590/1679-395129522
- Gil, A. C. *Como elaborar projetos de pesquisa*. São Paulo: Atlas, 2008.
- IBGE - Instituto Brasileiro de Geografia e Estatística. *Pesquisa Nacional por Amostra de Domicílios - PNAD - 2013*. Segurança Alimentar. Rio de Janeiro: PNAD/IBGE, 2014. Available on: <<https://biblioteca.ibge.gov.br/visualizacao/livros/liv94414.pdf>>.
- IBGE - Instituto Brasileiro de Geografia e Estatística. *Censo Agropecuário 2017*. Produção Agrícola Municipal. Brasília: SIDRA/IBGE, 2017. Available on: <<https://sidra.ibge.gov.br/pesquisa/pam/tabelas>>. Access on: mar. 2020.
- Lipsky, M. *Street-level bureaucracy: dilemmas of the individual in public services*. Nova York: Russel Sage Foundation, 1980.
- Lotta, G. S.; Pires, R. R. C.; Oliveira, V. E. Burocratas de médio escalão: novos olhares sobre velhos atores da produção de políticas públicas. *Revista do Serviço Público*, 65(4), 463-492, 2014. Available on: <<https://repositorio.enap.gov.br/handle/1/1836>>.
- Machado, P.; Schmitz, B.; González-Chica, D.; Corso, A.; Vasconcelos, F.; Gabriel, C. Compra de alimentos da agricultura familiar pelo Programa Nacional de Alimentação Escolar (PNAE): estudo transversal com o universo de municípios brasileiros. *Ciência & Saúde Coletiva*, 23, 4153-4164, 2018. doi: 10.1590/1413-812320182311.28012016
- Maia, A. H.; Sant'ana, A. L.; Silva, F. C. Políticas públicas de acesso à terra: uma análise do Programa Nacional de Crédito Fundiário, em Nova Xavantina (MT). *Revista de Economia e Sociologia Rural*, 56(2), 311-328, 2018. doi: 10.1590/1234-56781806-94790560208
- Morais, J. A.; Callou, A. B. F. Metodologias participativas e desenvolvimento local: a experiência do Projeto Dom Hélder Câmara no assentamento Moacir Lucena. *Interações*, 18(1), 165-177, 2017. doi: 10.20435/1984-042x-2017-v.18-n.1(13)
- Nascimento, C. E. P.; Santos, M. D. C. Análise das políticas públicas contra a seca no Semiárido nordestino. *Seminário Internacional sobre Desenvolvimento Regional*, 2019. Available on: <<https://online.unisc.br/acadnet/anais/index.php/sidr/article/viewFile/18991/1192612674>>.
- Nunes, E.M.; Moraes, A.C.; Aquino, J.R.; Gurgel, I.A. O Programa Nacional de Alimentação Escolar (PNAE) como política de inclusão na agricultura familiar do Nordeste

- do Brasil. *Revista GRIFOS*, 27(45), 114-139, 2018. doi: 10.22295/grifos.v27i45.4454
- Oliveira, A. Burocratas de linha de frente: executores e fazedores de políticas públicas. *Revista de Administração Pública*, 46(6), 1551-1573, 2012. doi: 10.1590/S0034-76122012000600007
- OPAS - Organização Pan-Americana da Saúde. *Sistemas alimentares e nutrição: a experiência brasileira para enfrentar todas as formas de má nutrição*. Brasília, DF: OPAS, 2017. Available on: <<https://iris.paho.org/handle/10665.2/34289>>.
- Pacheco, R. A. S.; Pacheco, C. R. Questão agrária e regularização fundiária: a ação do Estado e o conflito de interesses entre trabalhadores rurais sem terra e povos indígenas. *Planejamento e Políticas Públicas*, 20(34), 259-288, 2010. Available on: <<http://www.ipea.gov.br/ppp/index.php/PPP/article/view/175>>.
- Peixinho, A. A trajetória do Programa Nacional de Alimentação Escolar no período de 2003-2010: relato do gestor nacional. *Ciência & Saúde Coletiva*, 18(4), 909-916, 2013. doi: 10.1590/S1413-81232013000400002
- Pedraza, D. F.; Melo, N. L.; Silva, F. A.; Araujo, E. M. Avaliação do Programa Nacional de Alimentação Escolar: revisão da literatura. *Ciência & Saúde Coletiva*, 23(5), 1551-1560, 2018. doi: 10.1590/1413-81232018235.17832016
- Pires, R. Burocracia, discricionariedade e democracia: alternativas para o dilema entre controle do poder administrativo e capacidade de implementação. *Cadernos Gestão Pública e Cidadania*, 14(54), 147-187, 2009. doi: 10.12660/cgpc.v14n54.44190
- Pires, R. Between the law and the case: making sense of labor inspectors? Responses to risks at the workplace in Brazil. *Droit et Société*, 96, 273-288, 2017. doi: 10.3917/drs.096.0273
- Prezotto, L. L.; Nascimento, M. A. R. *Manual de Orientações sobre Constituição de Serviço de Inspeção Municipal (SIM)*. Brasília: SIM, 2013. Available on: <<https://www2.mppa.mp.br/sistemas/gcsubsites/upload/37/MANUAL%20-%20SIM%20-%20Servico%20de%20Inspecao%20Municipal.pdf>>.
- Sandim, T. L.; Assis, M. A. O arranjo institucional de implementação do PAIF e seus potenciais efeitos no cotidiano de operação do serviço: introduzindo questões para o debate. In: Pires, R. R. *Implementando desigualdades: reprodução de desigualdades na implementação de políticas públicas*. Rio de Janeiro: IPEA, 2019. Available on: <https://www.ipea.gov.br/portal/images/stories/PDFs/livros/livros/190612_implementando_desigualdades.pdf>.
- Saraiva, E.; Silva, A. P.; Sousa, A. A.; Cerqueira, G.; Chagas, C. M.; Toral, N. Panorama da compra de alimentos da agricultura familiar para o Programa Nacional de Alimentação Escolar. *Ciência & Saúde Coletiva*, 18, 927-935, 2013. doi: 10.1590/S1413-81232013000400004
- SEPLAN - Secretaria de Estado do Planejamento e das Finanças. *Relatório de identificação e mapeamento das aglomerações produtivas estado do Rio Grande do Norte*. Projeto RN sustentável. Natal: SEPLAN, 2013. Available on: <<https://docplayer.com.br/16481796-Projeto-rn-sustentavel-relatorio-de-identificacao-e-mapeamento-das-aglomeracoes-produtivas-do-estado-do-rio-grande-do-norte.html>>.
- Soares, P.; Martinelli, S. S.; Melgarejo, L.; Davó-Blanes, M.; Cavalli, S. B. Potencialidades e dificuldades para o abastecimento da alimentação escolar mediante a aquisição de alimentos da agricultura familiar em um município brasileiro. *Ciência & Saúde Coletiva*, 20(6), 1891-1900, 2015. doi: 10.1590/1413-81232015206.16972014
- Spinola, P. A.; Ollaik, L. G. Instrumentos governamentais reproduzem desigualdades nos processos de implementação de políticas públicas? In: Pires, R. R. *Implementando desigualdades: reprodução de desigualdades na implementação de políticas públicas*. Rio de Janeiro: IPEA, 2019. p. 329-348. Available on: <https://www.ipea.gov.br/portal/images/stories/PDFs/livros/livros/190612_implementando_desigualdades.pdf>.
- Swensson, L. F. J. Aligning policy and legal frameworks for supporting smallholder farming through public food procurement: The case of school feeding programmes. *Working Paper n. 177*. Roma/Brasília: FAO/IPC-IG, 2018. Available on: <<http://www.fao.org/policy-support/tools-and-publications/resources-details/en/c/1178099/>>.
- Triches, R. M.; Baccarin, J. G.; Figueredo, O. A. T.; Führ, A. L.; Mossmann, M. P.; Silva, D. B. P.; Heckler, D.; Teo, C. R. P. A. Dificuldades e recursos de superação mobilizados por atores sociais na aquisição de produtos da agricultura

familiar para a alimentação escolar nos estados de São Paulo, Paraná, Santa Catarina e Rio Grande do Sul. In: Cassarino, J. P. (Org.). *Abastecimento alimentar e mercados institucionais*. Praia, Cabo Verde: UNICV, 2018.

Triches, R. M.; Schneider, S. Alimentação escolar e agricultura familiar: reconectando o consumo à produção. *Saúde e Sociedade*, 19, 933-945, 2010. doi: 10.1590/S0104-12902010000400019

UN - United Nations. *Transforming our world: The 2030 Agenda for Sustainable Development*. New York; 2017.

Available on: <<https://sustainabledevelopment.un.org/post2015/transformingourworld>>.

Weber, M. Parlamentarismo e governo numa Alemanha reconstruída. In: Weber, M. *Textos selecionados*. São Paulo: Abril Cultural, 1980. p. 1-85.

Wehbe, M.; Seiler, R.; Vinocur, M.; Santos, C. *Social Methods for Assessing Agricultural Producers: Vulnerability to Climate Variability and Change Based on the Notion of Sustainability*. AIACC Working Paper n. 19, 2005.